wherein the input terminal portion comprises a first layer comprising the same material as that of the gate electrode and a second layer comprising the same material as that of the pixel electrode in contact with the first layer through a single contact hole formed only in the first insulating layer, and

wherein each of the gate electrode, the storage capacitor wiring and the first layer has a tapered portion formed on at least an end portion thereof.

REMARKS

Applicants will address each of the Examiner's objections and rejections in the order in which they appear in the Final Rejection.

Claim Objections

The Examiner has a number of objections to Claims 3, 6, 9, 12 and 25-30 for informalities therein. Applicants have amended each of these claims as suggested by the Examiner and request that this objection be withdrawn.

Claim Rejections - 35 USC §103

The Examiner also rejects Claims 3, 6, 9, 12 and 25-30 under 35 USC §103 as being unpatentable over Lee et al. in view of Kim and/or Ikeda et al. This rejection is respectfully traversed.

Independent Claims 3, 27, 29 and 30

In response to Amendment B and the arguments made therein, the Examiner in the Final

Rejection states (on page 6) that

> "[i]t appears that applicant's argument intend[sic] to imply that the claimed contact is only through a single contact hole formed only in the gate insulating layer. However, such features for the contact hole are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims."

Applicants have amended independent Claims 3, 27, 29 and 30 to recite the feature of "the pixel electrode in contact with the first layer through a single contact hole formed only in the first insulating layer."[1] It is respectfully submitted that such a feature is not disclosed by the cited references.

In particular, Lee in Fig. 11 discloses a pixel electrode 36a in contact with a gate pad 22 and 24 through a contact hole formed in an insulating film 26 and a protection film 34. Hence, this is clearly different than the structure of the claimed invention.

As the other references also do not disclose this feature, it is requested that the rejection of these independent claims and those claims dependent thereon over the cited art be withdrawn.

Independent Claims 25 and 28

Applicants have amended independent Claims 25 and 28 to recite the feature of "a second insulating layer comprising an inorganic material and formed on the pixel electrode." This feature is

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[1] This is shown in the specification and drawings at, for example, Figs. 3A-4B and pages 21-22 wherein first layer 204 in the input terminal portion is made of the same material as gate electrode 202; a single contact hole 217 is formed only in insulating layer 205; and a second layer 208 of the same material as pixel electrode 207 is formed in the contact hole 217 in contact with layer 204. As explained at pages 3-4 of the specification, with such a structure, the number of photomasks and steps used in the photolithography technique is reduced which results in reduced manufacturing costs and improved yield.

supported by, for example, Figs. 4A-4B in the present application. None of the cited references are believed to show the claimed semiconductor device with this feature. Accordingly, it is requested that the rejection of this claim now be withdrawn.

Independent Claim 26

Independent Claim 26 has been amended to recite the feature of "a wiring formed on the source and drain regions and a portion of the pixel electrode." This feature is also supported by, for example, Figs. 4A-B of the present application. None of the cited references are believed to show the claimed semiconductor device with this feature. Accordingly, it is requested that the rejection of this claim now be withdrawn.

Therefore, for at least the above-stated reasons, it is respectfully submitted that the rejection under 35 USC §103 over the cited art has been overcome. Accordingly, it is requested that this rejection be withdrawn.

IDS

Applicants are submitting an IDS herewith and request consideration of the IDS with the RCE and this amendment. The undersigned is also waiting for one further document to cite in an IDS. As soon as the undersigned receives this document, a further IDS will be submitted. It is requested that this further IDS also be considered with the RCE and this amendment

Conclusion

It is respectfully submitted that the present application is now in a condition for allowance.

If any further fee is due for this amendment or submission, please charge our Deposit Account No. 50-1039.

Favorable reconsideration is earnestly solicited.

Respectfully submitted,

Date: January 21, 2003

Mark J. Murphy
Registration No. 34,225

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Marked-up copy of the amendments made herein:

IN THE CLAIMS:

Please amend the claims as follows:

3. (Third Amendment) A semiconductor device comprising:

a substrate having an insulating surface;

a thin film transistor formed over the substrate, the thin-film transistor comprising a gate electrode formed over the substrate; [an insulating layer formed on the gate electrode] a first insulating layer, wherein a portion of said first insulating layer is formed on said gate electrode; a channel formation region formed in a semiconductor layer having an amorphous structure; source and drain regions, each of the source and drain regions comprising a semiconductor layer including [one-conductive type impurity elements] elements of a first conductivity type, formed over the semiconductor layer having the amorphous structure;

[an interlayer insulating layer] a second insulating layer comprising an inorganic material and formed on the semiconductor layer having the amorphous structure and the semiconductor layer containing the [one-conductive type impurity elements] elements of a first conductivity type so as to be in contact with at least a part of the channel formation region;

a pixel electrode formed in contact with the first insulating layer; and

an input terminal portion formed along an end portion of the substrate and electrically connected to a wiring;

wherein the input terminal portion comprises a first layer comprising the same material as that of the gate electrode and a second layer comprising the same material as that of the pixel electrode in contact with the first layer through a single contact hole formed only in the first insulating layer.

6. (Amended) A semiconductor device as claimed in claim 3, wherein the gate electrode [is comprising] comprises a heat-resistant electrically conductive material, or the heat-resistant electrically conductive material and a low-resistive electrically conductive material.

9. (Amended) A semiconductor device as claimed in claim 6, wherein the heat-resistant electrically conductive material [is comprising] comprises one of an element selected from titanium (Ti), tantalum (Ta) [or] and tungsten (W), a compound that contains any one of the above elements, a compound film that combines the above elements together, [or] and a nitride that contains any one of the above elements; and

wherein the low-resistive electrically conductive material [is comprising] comprises a material containing aluminum (Al).

12. A semiconductor device as claimed in claim 3, wherein the semiconductor device comprises one of a personal computer, a video camera, a portable information terminal, a digital camera, a digital video disc player, an electronic play device and a television.

25. (Amended) A semiconductor device comprising:

a substrate having an insulating surface;

a thin film transistor formed over the substrate, the thin-film transistor comprising a gate electrode formed over the substrate; [an insulating layer formed on the gate electrode] a first insulating layer, where a portion of said insulating layer is formed on said gate electrode; a channel formation region formed in a semiconductor layer having an amorphous structure; source and drain regions, each of the source and drain regions comprising a semiconductor layer including [one-conductive type impurity elements] elements of a first conductivity type, formed over the semiconductor layer having the amorphous structure;

a pixel electrode formed in contact with the first insulating layer,

[an interlayer insulating layer] a second insulating layer comprising an inorganic material and formed on the pixel electrode and the semiconductor layer having the amorphous structure and the semiconductor layer containing the [one-conductive type impurity elements] elements of a first conductivity type so as to be in contact with at least a part of the channel formation region; and

[a pixel electrode formed in contact with the insulating layer; and]

an input terminal portion formed along an end portion of the substrate and electrically connected to a wiring;

wherein the input terminal portion includes a first layer comprising the same material as that of the gate electrode and a second layer comprising the same material as that of the pixel electrode, and

wherein each of the gate electrode and the first layer has a tapered portion formed on at least an end portion thereof.

26. (Amended) A semiconductor device comprising:

a substrate having an insulating surface;

a thin film transistor formed over the substrate, the thin-film transistor comprising a gate electrode formed over the substrate; [an insulating layer formed on the gate electrode] a first insulating layer, wherein a portion of said insulating layer is formed on said gate electrode; a channel formation region formed in a semiconductor layer having an amorphous structure; source and drain regions, each of the source and drain regions comprising a semiconductor layer including [one-conductive type impurity elements] elements of a first conductivity type, formed over the semiconductor layer having the amorphous structure;

[an interlayer insulating layer] a second insulating layer comprising an inorganic material and formed on the semiconductor layer having the amorphous structure and the semiconductor layer containing the [one-conductive type impurity elements] elements of a first conductivity type so as to be in contact with at least a part of the channel formation region;

a pixel electrode formed in contact with the first insulating layer;

a wiring formed on the source and drain regions and a portion of the pixel electrode;

a storage capacitor comprising a storage capacitor wiring comprising the same material as that of the gate electrode, the first insulating layer on the storage capacitor wiring and the pixel electrode on the first insulating layer; and

an input terminal portion formed along an end portion of the substrate and electrically connected to a wiring;

wherein the input terminal portion includes a first layer comprising the same material as that of the gate electrode and a second layer comprising the same material as that of the pixel electrode.

27. (Amended) A semiconductor device comprising:

a substrate having an insulating surface;

a thin film transistor formed over the substrate, the thin-film transistor comprising a gate electrode formed over the substrate; [an insulating layer formed on the gate electrode] a first insulating layer, wherein a portion of said first insulating layer is formed on said gate electrode; a channel formation region formed in a semiconductor layer having an amorphous structure; source and drain regions, each of the source and drain regions comprising a semiconductor layer including [one-conductive type impurity elements] elements of first conductivity type, formed over the semiconductor layer having the amorphous structure;

[an interlayer insulating layer] a second insulating layer comprising an inorganic material and formed on the semiconductor layer having the amorphous structure and the semiconductor layer containing the [one-conductive type impurity elements] elements of first conductivity type so as to be in contact with at least a part of the channel formation region;

a pixel electrode formed in contact with the first insulating layer;

a storage capacitor comprising a storage capacitor wiring comprising the same material as that of the gate electrode, the first insulating layer on the storage capacitor wiring and the pixel electrode on the first insulating layer; and

an input terminal portion formed along an end portion of the substrate and electrically connected to a wiring;

wherein the input terminal portion comprises a first layer comprising the same material as that of the gate electrode and a second layer comprising the same material as that of the pixel electrode in contact with the first layer through a single contact hole formed only in the first insulating layer.

28. (Amended) A semiconductor device comprising:

a substrate having an insulating surface;

a thin film transistor formed over the substrate, the thin-film transistor comprising a gate electrode formed over the substrate; [an insulating layer formed on the gate electrode] a first insulating layer, wherein a portion of said first insulating layer is formed on said gate electrode; a channel formation region formed in a semiconductor layer having an amorphous structure; source and drain regions, each of the source and drain regions comprising a semiconductor layer including [one-conductive type impurity elements] elements of first conductivity type, formed over the semiconductor layer having the amorphous structure;

a pixel electrode formed in contact with the first insulating layer;

[an interlayer insulating layer] a second insulating layer comprising an inorganic material and formed on the pixel electrode and the semiconductor layer having the amorphous structure and the semiconductor layer containing the [one-conductive type impurity elements] elements of first conductivity type so as to be in contact with at least a part of the channel formation region;

[a pixel electrode formed in contact with the insulating layer;]

a storage capacitor comprising a storage capacitor wiring comprising the same material as that of the gate electrode, the first insulating layer on the storage capacitor wiring and the pixel electrode on the first insulating layer; and

an input terminal portion formed along an end portion of the substrate and electrically connected to a wiring;

wherein the input terminal portion includes a first layer comprising the same material as that of the gate electrode and a second layer comprising the same material as that of the pixel electrode,

and

wherein each of the gate electrode, the storage capacitor wiring and the first layer has a tapered portion formed on at least an end portion thereof.

29. (Amended) A semiconductor device comprising:

a substrate having an insulating surface;

a thin film transistor formed over the substrate, the thin-film transistor comprising a gate electrode formed over the substrate; [an insulating layer formed on the gate electrode] a first insulating layer, wherein a portion of said first insulating layer is formed on said gate electrode; a channel formation region formed in a semiconductor layer having an amorphous structure; source and drain regions, each of the source and drain regions comprising a semiconductor layer including [one-conductive type impurity elements] elements of first conductivity type, formed over the semiconductor layer having the amorphous structure;

[an interlayer insulating layer] a second insulating layer comprising an inorganic material and formed on the semiconductor layer having the amorphous structure and the semiconductor layer containing the [one-conductive type impurity elements] elements of first conductivity type so as to be in contact with at least a part of the channel formation region;

a pixel electrode formed in contact with the first insulating layer; and

an input terminal portion formed along an end portion of the substrate and electrically connected to a wiring;

wherein the input terminal portion comprises a first layer comprising the same material as that of the gate electrode and a second layer comprising the same material as that of the pixel electrode

in contact with the first layer through a single contact hole formed only in the first insulating layer, and

wherein each of the gate electrode and the first layer has a tapered portion formed on at least an end portion thereof.

30. (Amended) A semiconductor device comprising:

a substrate having an insulating surface;

a thin film transistor formed over the substrate, the thin-film transistor comprising a gate electrode formed over the substrate; [an insulating layer formed on the gate electrode] a first insulating layer, wherein a portion of said first insulating layer is formed on said gate electrode; a channel formation region formed in a semiconductor layer having an amorphous structure; source and drain regions, each of the source and drain regions comprising a semiconductor layer including [one-conductive type impurity elements] elements of first conductivity type, formed over the semiconductor layer having the amorphous structure;

[an interlayer insulating layer] a second insulating layer comprising an inorganic material and formed on the semiconductor layer having the amorphous structure and the semiconductor layer containing the [one-conductive type impurity elements] elements of first conductivity type so as to be in contact with at least a part of the channel formation region;

a pixel electrode formed in contact with the first insulating layer;

a storage capacitor comprising a storage capacitor wiring comprising the same material as that of the gate electrode, the first insulating layer on the storage capacitor wiring and the pixel electrode on the first insulating layer; and

an input terminal portion formed along an end portion of the substrate and electrically connected to a wiring;

wherein the input terminal portion comprises a first layer comprising the same material as that of the gate electrode and a second layer comprising the same material as that of the pixel electrode in contact with the first layer through a single contact hole formed only in the first insulating layer, and

wherein each of the gate electrode, the storage capacitor wiring and the first layer has a tapered portion formed on at least an end portion thereof.